WE CLAIM:

1. A method of stabilizing an operating wavelength of a laser, comprising:

illuminating an optical element with light output from the laser to produce an interference pattern;

detecting at least three different portions of the interference pattern to generate at least three respective detection signals;

generating a feedback signal using the at least three detection signals; and

adjusting the operating wavelength of the laser in response to the feedback signal.

2. A method as recited in claim 1, further comprising reflecting the interference pattern from the optical element to a detector unit having at least three detection elements disposed to respectively detect the at least three different portions of the interference pattern.

3. A method as recited in claim 1, further comprising detecting movement of intensity peaks of the interference pattern as the operating wavelength changes.

4. A method as recited in claim 1, further comprising illuminating at least three detector elements of a detector unit with the interference pattern, wherein the interference pattern has a period P and the at least three detector elements are spaced apart by approximately $mP + kP/n$, where k and m are integers and n is the number of detector elements.

5. A method as recited in claim 4, wherein the at least three detector elements are paced apart by P/n.

6. A method as recited in claim 4, wherein the detector unit includes additional detector elements positioned to detect phase positions of the interference pattern corresponding to phase positions of the interference pattern detected by the at least three detector elements, the additional detector elements being spaced from their corresponding ones of the at least three detector elements by an integral number of periods.

7. A method as recited in claim 6, further comprising summing detection signals from the at least three detector elements and their respective additional detector elements to form summed signals for each phase portion of the interference pattern detected by one of the at least three detector elements, and generating the feedback signal using the summed signals.

8. A method as recited in claim 1, further comprising summing the at least three detection signals to produce a signal indicative of a power level of the laser.

9. A method as recited in claim 1, further comprising compensating the detection signals for a light intensity distribution function.

10. A method as recited in claim 1, further comprising generating phase signals using the detection signals and wherein generating the feedback signal includes generating the feedback signal using the phase signals.

11. A method as recited in claim 10, wherein there are three detection signals designated R, S, and T, corresponding to three detector elements, and further comprising generating a power signal, $I = (R+S+T)/3$, indicative of laser power.

12. A method as recited in claim 11, wherein generating the phase signals includes generating a sine signal, sin (φ) = $(T-R)/(I\sqrt{3})$, a cosine signal, cosine (φ) = $(S-I)/I$ and a phase signal φ = arctangent $((\sin(\varphi))/(\cos(\varphi)))$.

13. A method as recited in claim 12, further comprising illuminating the non-parallel etalon with light of a known wavelength and measuring standard detection signals R_0, S_0 and T_0 for the three detector elements respectively, generating a standard power signal $I_0 = (R_0+S_0+T_0)/3$ and generating a standard sine signal, sin (φ_0) = $(T_0-R_0)/(I_0\sqrt{3})$, a standard cosine signal, cosine (φ_0) = $(S_0-I_0)/I_0$ and a standard phase signal φ_0 = arctangent $((\sin(\varphi_0))/(\cos(\varphi_0)))$.

14. A method as recited in claim 13, further comprising generating a transformed sine signal, $\sin(\varphi') = -\sin(\varphi_0)\cos(\varphi) + \cos(\varphi_0)\sin(\varphi)$, a transformed cosine signal, $\cos(\varphi') = \cos(\varphi_0)\cos(\varphi) + \sin(\varphi_0)\sin(\varphi)$, and a transformed phase signal, $\varphi' = \tan^{-1}(\sin(\varphi')/\cos(\varphi'))$.

15. A method as recited in claim 14, wherein the feedback signal is the transformed phase signal.

16. A method as recited in claim 14, wherein the feedback signal is the transformed sine signal.

17. A method as recited in claim 1, wherein illuminating the non-parallel etalon

18. A method as recited in claim 1, further comprising stabilizing the operating wavelength to one of a number of ITU standard optical communications wavelengths.

19. A system for stabilizing an operating wavelength of a laser, comprising:

means for illuminating an optical element with light output from the laser to produce an interference pattern;

means for detecting at least three different portions of the interference pattern to generate at least three respective detection signals;

means for generating a feedback signal using the at least three detection signals; and

means for adjusting the operating wavelength of the laser in response to the feedback signal.

20. A method of monitoring light output by a laser, comprising:

producing a periodic optical interference pattern by illuminating an optical element with the light output by the laser;

detecting at least three different portions of the periodic optical interference pattern to generate at least three respective detection signals; and

generating a power signal indicative of output power from the laser using the at least three detection signals.

21. A method as recited in claim 20, wherein producing the periodic optical interference pattern includes illuminating a non-parallel etalon with the light output by the laser.

22. A method as recited in claim 20, further comprising detecting movement of intensity peaks of the interference pattern as the operating wavelength changes.

23. A method as recited in claim 21, wherein the non-parallel etalon is a wedge etalon having substantially planar surfaces.

24. A method as recited in claim 21, wherein the non-parallel etalon has at least one curved surface.

25. A method as recited in claim 20, wherein producing the periodic optical interference pattern includes reflecting at least a portion of the light produced by the laser off the optical element.

26. A method as recited in claim 20, wherein detecting the at least three different portions of the periodic optical interference pattern includes providing at least three detector elements at respectively different phase portions of the periodic optical interference pattern, the different phase portions of the periodic optical interference pattern corresponding to evenly spaced portions of a period of the periodic optical interference pattern.

27. A method as recited in claim 20, wherein generating the power signal includes adding the at least three detection signals.

28. A method as recited in claim 20, further comprising generating a feedback signal using the at least three detection signals and stabilizing wavelength of the light output from the laser using the feedback signal.

29. A system for monitoring light output by a laser, comprising:

means for producing a periodic optical interference pattern;

means for detecting at least three different portions of the periodic optical interference pattern to generate at least three respective detection signals; and

means for generating a power signal indicative of output power from the laser using the at least three detection signals.